

WHAT IS CLAIMED IS:

1. A packet-relaying device, comprising:
 - a plurality of queues, each of said plurality of queues being operable to store a packet in correspondence to priority thereof;
 - a scheduler operable to take out a packet from one of said plurality of queues to output the packet to outside of the packet-relaying device;
 - a packet-classifying-rule-storing unit operable to store a packet-classifying rule;
 - a packet-classifying unit operable to output a packet to one of said plurality of queues based on the packet-classifying rule stored in said packet-classifying-rule-storing unit; and
 - a flow information-storing unit operable to store flow-defining information of a flow and priority information of the flow,
wherein said flow information-storing unit is operated in a manner different from that of said packet-classifying-rule-storing unit.
2. A packet-relaying device as defined in claim 1, wherein the flow-defining information includes a source IP address of an IP header, a destination IP address of the IP header, a protocol number of the IP header, and an identification of the IP header.
3. A packet-relaying device as defined in claim 1, further comprising a header-checking unit operable to check whether or not an inputted packet is a non-head fragmented packet.
4. A packet-relaying device as defined in claim 3, wherein said header-checking unit is operable to judge whether or not the inputted packet is a head fragmented packet, and
wherein the packet-relaying device further comprises a flow information-registering unit operable to register, into said flow information-storing unit, flow-defining information of a flow to which the inputted packet belongs and priority information of the flow when said header-checking unit judges that the inputted packet

is a head fragmented packet.

5. A packet-relaying device as defined in claim 3, further comprising a flow-determining unit operable to output a packet that is judged to be a non-head fragmented packet by said header-checking unit to one of said plurality of queues, based on the flow-defining information and the priority information stored in said flow information-storing unit,

wherein said packet-classifying unit outputs a packet that is judged to be not a non-head fragmented packet by said header-checking unit to one of said plurality of queues, based on the packet-classifying rule stored in said packet-classifying-rule-storing unit.

6. A packet-relaying device as defined in claim 5, wherein said flow-determining unit judges whether a non-head fragmented packet is a final non-head fragmented packet, and

wherein the packet-relaying device further comprises a deleting unit operable to delete flow-defining information of a flow to which the final non-head fragmented packet belongs and priority information of the flow from said flow information-storing unit.

7. A packet-relaying device as defined in claim 1, further comprising a deleting unit operable to delete flow-defining information of a flow when any packet belonging to the flow is not inputted for a predetermined time and priority information of the flow from said flow information-storing unit.

8. A packet-relaying device as defined in claim 1, further comprising a flow-determining unit operable to output a packet to one of said plurality of queues based on flow-defining information and priority information stored in said flow information-storing unit when the flow-defining information of a flow of the packet and the priority information of the flow are registered in said flow information-storing unit,

wherein said packet-classifying unit outputs the packet to one of said plurality

of queues based on packet-classifying rule stored in said packet-classifying-rule-storing unit when the flow-defining information of a flow of the packet and the priority information of the flow are not registered in said flow information-storing unit.

9. A packet-relaying device as defined in claim 8, further comprising an RTP-judging unit operable to judge whether or not the packet is an RTP packet.

10. A packet-relaying device as defined in claim 9, wherein, when the packet has a UDP header, and a port number of the UDP header is an even number that is “1024” or more, said RTP-judging unit judges that the packet is an RTP packet, according to at least one of a version field after the UDP header and a payload type field of an RTP payload, the version field indicating an RTP protocol version.

11. A packet-relaying device as defined in claim 9, further comprising a flow information-registering unit operable to register, when said RTP-judging unit judges that the packet is an RTP packet, flow-defining information of a flow of the packet and priority information of the flow into said flow information-storing unit.

12. A packet-relaying device as defined in claim 9, wherein the flow-defining information includes a port number of a TCP/UDP header, and

wherein, when said RTP-judging unit judges that the packet is an RTP packet, said flow-determining unit outputs the packet to one of said plurality of queues, based on information that a value of “1” is added to a port number of a TCP/UDP header of flow-defining information relating to the packet and priority information of an RTCP packet.

13. A packet-relaying device as defined in claim 9, wherein the flow-defining information includes a port number of a TCP/UDP header, and

wherein, when said RTP-judging unit judges that the packet is an RTP packet, said flow information-registering unit registers information that a value of “1” is added to a port number of a TCP/UDP header of flow-defining information relating to the packet and priority information of the packet into said flow information-storing unit.

14. A packet-relaying device as defined in claim 9, further comprising a header-checking unit operable to judge if an inputted packet is a non-head fragmented packet, wherein said flow-determining unit inputs the inputted packet from said header-checking unit.

15. A packet-relaying device as defined in claim 1, further comprising an AV packet-judging unit operable to judge whether or not an inputted packet is an AV packet,

wherein said packet-classifying unit outputs the packet to one of said plurality of queues such that an AV packet has higher priority than a non AV packet.

16. A packet-relaying device as defined in claim 15, wherein, when the inputted packet is an HTTP packet, said AV packet-judging unit judges whether or not the inputted packet is an AV packet according to information of Context-Type of the inputted packet.

17. A packet-relaying device as defined in claim 15, wherein, when a packet of a flow defined in said flow information-storing unit has been inputted continuously for a predetermined time, said AV packet-judging unit judges that the flow defined in said flow information-storing unit is a flow of an AV packet.

18. A packet-relaying device as defined in claim 15, wherein said AV packet-judging unit judges whether or not a flow defined in said flow information-storing unit is related to an AV packet, by comparing a number of inputted packets of the flow with a predetermined AV threshold.

19. A packet-relaying device as defined in claim 15, wherein said flow information-storing unit stores information of an AV threshold concerning a flow defined therein, and

wherein said AV packet-judging unit judges whether or not the packet is an AV packet using the AV threshold that is stored in said flow information storing unit and that is set based on packet size such that the AV threshold is greater for a video packet

than for an audio packet.

20. A packet-relaying device as defined in claim 19, further comprising an item-deleting unit operable to delete information of a flow from said flow information-storing unit when an inputted packet defined in said flow information-storing unit has a packet size different from the packet size stored in said flow information-storing unit.

21. A packet-relaying device as defined in claim 1, further comprising an RTP-judging unit operable to judge whether or not an inputted packet is an RTP packet,

wherein said RTP-judging unit judges that a flow defined in said flow information-storing unit is a flow of an RTP packet when a packet of the flow defined in said flow information-storing unit has been inputted continuously for a predetermined time.

22. A packet-relaying device as defined in claim 21, wherein said RTP-judging unit judges whether or not a flow defined in said flow information-storing unit is related to an RTP packet, by comparing a number of inputted packets of the flow with a predetermined RTP threshold.

23. A packet-relaying device as defined in claim 21, wherein said flow information-storing unit stores information of an AV threshold of a flow defined therein, and

wherein said RTP-judging unit judges whether or not an inputted packet is an RTP packet by using the AV threshold that is stored in said flow information storing unit and that is set such that the AV threshold is greater for a video packet than for an audio packet.

24. A packet-relaying device as defined in claim 21, wherein said RTP-judging unit judges that information relates to a flow of an RTCP packet, the information including an item that a value of “1” is added to a port number of a TCP/UDP header of the flow-defining information regarded as relating to an RTP packet and stored in said flow information-storing unit.

25. A packet-relaying device as defined in claim 21, wherein said flow information-storing unit stores SSRC information of an RTP header.

26. A packet-relaying device as defined in claim 25, further comprising an item-deleting unit operable to delete information of a flow from said flow information-storing unit, in at least one of

a case where a packet belonging to a flow defined in said flow information-storing unit is inputted and SSRC information to which the inputted packet belongs is not equal to a value of a SSRC field of an RTP header of the inputted packet, and

a case where a packet belonging to a flow defined in said flow information-storing unit is inputted and a value of a payload type field to which the inputted packet belongs is not equal to a value of a payload type field of an RTP header of the inputted packet.

27. A packet-relaying device as defined in claim 1, further comprising:

a switch and

a packet-classifying-rule-changing unit operable to change the packet-classifying rule stored in said packet-classifying-rule-storing unit according to a state of said switch.

28. A packet-relaying device as defined in claim 27, wherein said switch comprises at least one of

an RTP switch operable to specify a class to which an application using an RTP should be classified; a DSCP switch operable to enable or disable processes corresponding to a value of DSCP; a flow label switch operable to enable or disable processes corresponding to a flow label of an IPv6 packet; and a VLAN tag switch operable to enable or disable processes corresponding to priority of a frame with a VLAN tag.